

AMENDED CLAIMS

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1. A device for utilizing stored power in a combustion engine, comprising:
an engine control unit (ECU) configured to receive measurements of one or more engine conditions and to calculate an amount of unused engine power based upon said measurements and on a nominal power rating of the engine when the engine is operated below said nominal power rating, and to store the calculated value of said amount of unused engine power in memory as data representing unused engine power.
2. The device as recited by claim 1, wherein:
said engine conditions may include one or more of air intake flow, engine speed, engine load, fuel flow and engine output torque.
3. The device as recited by claim 1, wherein:
said ECU is further configured to prohibit operation of the engine at an output power greater than said nominal power rating unless said ECU determines that the value of the amount of unused engine power is greater than zero.
4. The device as recited in claim 1, wherein:
said ECU is further configured to calculate an amount of released power based upon said measurements and said nominal power rating when the engine is operated above said nominal power rating, and to update said value of unused

engine power data stored in memory by subtracting the value of said amount of released power from said value of unused engine power data.

5. The device as recited in claim 1, wherein said ECU is further configured to display said value of unused engine power data on a display device in said vehicle.

6. The device as recited in claim 1, further comprising:

a control means that allows the vehicle operator to initiate and terminate operation of the engine at an increased power output above the nominal power output of the engine.

7. The device as recited in claim 6 wherein the engine includes a turbo charger and a fuel injection unit that when initiated allows the engine to operate above the nominal power output of the engine, wherein

said control means allows the operator to control operation of the turbo charger and fuel injection unit to operate the engine at an increased power output above the nominal power output of the engine.

8. The device as recited by claim 1, wherein said engine is used in a motor vehicle and said ECU is further configured to receive measurements of one or more vehicle conditions and to calculate the amount of unused engine power based upon said measurements of one or more engine and vehicle conditions.

9. The device as recited by claim 8, wherein:

said engine conditions may include one or more of air intake flow, engine speed, engine load, fuel flow and engine output torque.

10. The device as recited in claim 8, wherein said ECU is further configured to display said amount of unused engine power on a display device within said vehicle.

11. The device as recited in claim 8, further comprising:

a control means that allows an operator of the vehicle to initiate and terminate operation of the engine at an increased power output above the nominal power output of the engine.

12. The device as recited in claim 11 wherein the engine includes a turbo charger and a fuel injection unit when initiated allows the engine to operate above the nominal power output of the engine, wherein

said control means allows the vehicle operator to control operation of the turbo charger and fuel injection unit to operate the engine at an increased power output above the nominal power output of the engine.

13. A device for utilizing stored power in a combustion engine, comprising:

sensing means for measuring one or more engine or vehicle conditions; and

processor means for receiving measurements from said sensing means,

calculating an amount of unused engine power based upon said measurements and storing the value of said amount of unused engine power as stored power data.

14. A device as recited by claim 13, wherein said conditions may include one or more of air intake flow, engine speed, engine load, fuel flow and engine output torque.

15. A device as recited by claim 13, wherein said processing means prohibits operation of the engine at an output power greater than a nominal power rating unless the value of stored power data is greater than zero.

16. The device as recited in claim 13, wherein said processor means calculates an amount of released stored power based upon said measurements and said nominal power rating when the engine is operated above said nominal power rating, and updates said value of stored power data in memory by subtracting the value of said amount of released power from said value of stored power data.

17. The device as recited in claim 13, further comprising display means for indicating the amount of unused power, wherein said processor means causes said value of stored power data to be displayed with said display means.

18. The device as recited in claim 13, further comprising control means that allows initiation and termination of operation at an increased power output of the engine above the nominal power output of the engine.

19. The device as recited in claim 13 wherein the engine includes an increased power means for allowing the engine to operate above the nominal power output of

the engine, said device further comprising control means that allows initiation and termination said increased power means.

20. The device as recited in claim 18, wherein operation of the engine at an increased power output above the nominal power output of the engine is prevented unless the value of stored power data is greater than zero.

21. The device as recited in claim 18, wherein initiation of said increased power means is prevented unless the value of stored power data is greater than zero.

22. The device as recited in claim 18, wherein said increased power means is terminated when the value of stored power data is less than or equal to zero.

23. A method for utilizing stored power of a combustion engine, said method comprising steps of:

- measuring at least one engine parameter of said combustion engine;
- calculating an amount of unused engine power based upon the at least one engine parameter measured;
- storing the value of the calculated amount of unused power in a memory; and
- providing an indication of an accumulated amount of unused power to an operator of the engine based on the amount of unused power stored in the memory in the storing step.

24. The method as recited by claim 23, wherein said parameters may include one or more of air intake flow, engine speed, engine load, fuel flow and engine output torque.

25. The method as recited by claim 23, further comprising a step of allowing operation of the engine at an output power greater than a nominal power rating when the value of unused power in the memory is less than or equal to zero.

26. The method as recited by claim 25, wherein said calculating step includes calculating an amount of released stored power based upon the measurements and a nominal power rating of the engine when the engine is operated above the nominal power rating, and the storing step includes updating the value of the calculated amount of unused power in memory by subtracting the value of the amount of released power therefrom.

27. The method as recited by claim 23, wherein said combustion engine is in a vehicle and the providing step includes displaying the amount of unused engine power on a display device in the vehicle where said display device can be viewed by an operator of the vehicle.

28. The method as recited by claim 23, further comprising a control means that allows initiation and termination of operation of said engine at an increased power output above the nominal power output of the engine.

29. The method as recited by claim 23, wherein the engine includes an increased power means for allowing the engine to operate above the nominal power output of the engine, said method further comprising a step of providing a means for initiating and terminating said increased power means.

30. The method as recited by claim 23, wherein said calculating step includes calculating an amount of power produced by the engine based upon the measurements in said measuring step and taking the difference between the amount of power produced and a nominal power rating of the engine for a specified time period, wherein when the amount of power produced is less than the nominal power rating, an amount of unused power is the resulting difference, and when the amount of power produced is greater than the nominal power rating, an amount of released power is the resulting difference; and

said storing step includes adding the value of unused power to an accumulated value and subtracting the value of released power from the accumulated value.

31. The method as recited by claim 23, wherein said engine is used in a vehicle, and wherein said measuring step includes measuring at least one vehicle condition.

**STATEMENT ON DIFFERENCES BETWEEN THE
CLAIMS AS FILED AND AS AMENDED**

Claims 1-31 are replaced with attached replacement claims 1-31, shown in clean form on the attached Replacement Sheets. A marked-up copy of the amendments is attached for the convenience of the Bureau.

STATEMENT PURSUANT ARTICLE 19(1)

The Amendments to the claims clarify the invention by changing the claim terms "power storage device" and "stored power" to "device for utilizing stored power" and "data representing unused engine power," respectively. Accordingly, it should now be clear that the present invention is not a power storage device, such as a battery system, and is instead, a system for determining an amount of unused engine power for a vehicle, such as a heavy truck. The unused engine power itself is not stored in the ECU. Rather, the engine ECU determines the amount and controls the combustion engine so as to operate at an increase engine output, vel non.

Respectfully submitted,

By 
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